Oyster Pond Subwatershed
Falmouth, Cape Cod, Massachusetts

The Oyster Pond Subwatershed is located in Falmouth. It is a small subwatershed with an area of 264 acres. The area has residential, but no commercial, development.

Oyster Pond is a coastal pond that drains into Vineyard Sound. Studies of Oyster Pond's water quality over the past several decades have demonstrated a drastic decline in the pond's water quality. Nutrient levels (nitrates and phosphates) increased greatly due to the growing human population in the area, and the salinity of the pond increased substantially because of both the construction of a larger-diameter culvert at the pond's outlet into Trunk River Lagoon and the frequent dredging of the Trunk River, the pond's link to Vineyard Sound. Trunk River was, in the past, the most productive herring (alewife) run of Falmouth, which implies that Oyster Pond must have been a good spawning ground and nursery for these fish. From the mid-eighties on, herring declined drastically in the pond.

In 1994 residents in the Oyster Pond area formed Oyster Pond Environmental Trust, Inc. (OPET) to improve the pond's health. OPET works on land conservation in the pond's watershed, monitors pond water quality in collaboration with the Falmouth Pond Watcher's Program, informs and educates the public about the impact of human activity on Oyster Pond; and works with the Town of Falmouth on a pond management plan that is based on long-term scientific studies of the pond.

The Trunk River and Oyster Pond have been the subjects of several management actions in an effort to reduce the salinity of the pond. The Falmouth Pond Watchers program began a restoration project to freshen Oyster Pond in the mid 1990's. Dredging of Trunk River was halted and this led to a reduction in the tidal inflow into the pond. That, in turn, lowered salinity and improved water quality as evidenced by better oxygenation of the deeper water layers. Pond monitoring results from the 1997 season showed that the reduction of tidal exchange in the pond seemed to be succeeding. The surface water salinity of Oyster Pond returned to historic levels of two parts per thousand and the depth distribution of salinity nearly returned to levels recorded in 1964. Nitrogen levels within the inner basins of the pond were well below the 1987-1994 levels and the extent of a zone of hydrogen sulfide in the pond diminished.

Another step in the restoration effort came with the construction of an adjustable weir in 1998 to provide a method of controlling saltwater inflow into Oyster Pond. This project was initiated by OPET and financed by the Town of Falmouth. Studies conducted by OPET a year after the weir went in showed that the reduction of saltwater inflow into Oyster Pond resulting from the high sill at the Trunk River caused an excessive freshening of the pond. Associated with this freshening, the vital signs of the pond, such as dissolved oxygen levels, clarity (Secchi depth) and abundance of fish improved considerably. A breeding population of white perch has reestablished itself and the pond seemed to be able to support a greater number of waterfowl during the winter. In the summer of 2000, salinity levels in Oyster Pond were – for the first time – below the limits outlined in the pond's management plan. In the fall/winter of 2000/2001, through the efforts of OPET and funds from Falmouth, the jetties at the entrance to the Trunk River were rebuilt and the Trunk River was dredged. As a result, the weir now controls the water exchange in Oyster Pond and the salt content has risen to the low end of the target range.

Water quality in Oyster Pond continues to be influenced by new houses being built in the watershed, the input of ocean water from the weir, and the amount of freshwater that enters the pond. Additionally, habitat is being impacted as *Phragmites* is taking over the south shore of the pond and lagoon and purple loosestrife is invading marshy areas.

Zinn Park, a 7.5 acre area off of Ransom Road, was established in 1994 to protect land at the headwaters of Oyster Pond. It is owned and managed by OPET. OPET is currently engaged in a project to identify parcels to put under conservation.

There is a municipal water system but no public sewer system in this subwatershed

Stewards:

- Oyster Pond Environmental Trust (www.opet.org)
- Falmouth Pond Watchers
- Falmouth Associations Concerned with Estuaries and Saltponds (FACES)

Studies conducted in the watershed:

- A Coastal Pond Study by Oceanographic Methods. 1997. K.O Emory. Available from OPET.
- Water Quality Monitoring of Falmouth's Coastal Ponds: Results from the 1997 Season. Falmouth Pond Watchers. June 1998. Report contains results from the 1994-1996 sampling seasons.
- The Oyster Pond Remediation Project: Effects of Reduction in Salinity on the Pond Water Quality. Oyster Pond Environmental Trust.
- Controlling Saltwater Inflow into Oyster Pond: Effect on the Pond's Water Quality of Construction of a Weir at the Pond's Outlet. (Report on the first year of the weir, April 1998 – May 1999). The following parameters were measured in this study: pond level, water temperature and clarity, salinity, dissolved oxygen, nutrients (nitrates, phosphates), fecal coliform counts, and relative abundance of fish.
- Watershed Influences on Oyster Pond. A project conducted by the 2001 Marine Ecology class, Boston University Marine Program (BUMP), Marine Biological Laboratory (MBL), Woods Hole, MA. 2001.
- Oyster Pond was selected as a priority area for the Estuaries Project, Southeastern Massachusetts Embayment Restoration, funded by the state and UMass Dartmouth. The goal of the project is to develop critical nutrient loading thresholds for each embayment to aid in water resources planning. This will support federal requirements for the development of Total Maximum Daily Loads for impaired surface waters. This area was evaluated in 2002.
- Cape Cod Atlas of Tidally Restricted Salt Marshes. 2001. Cape Cod Commission.

Who is collecting water quality data and where:

- Falmouth Pond Watchers and the Oyster Pond Environmental Trust. In 1999 and 2000, monitoring was done on Oyster Pond for salinity, dissolved oxygen, fecal coliform counts, and Secchi depth. Some data published in the semi-annual OPET newsletter *The Watershed*, available online at www.opet.org. Other data available from OPET.
- Sea Education Association (SEA), BUMP, MBL – Oyster Pond.
- The United States Geological Survey maintains a stream flow gauge in Oyster Pond, collecting data that will be used in the Massachusetts Estuaries Project.

Management actions taken:

- Restoration project to freshen Oyster Pond in the mid 1990's, undertaken by the Falmouth Pond Watcher program.
- At the behest of OPET, a weir was constructed in March 1998 at the outflow of Oyster Pond into Trunk River Lagoon, on the pond side of the culvert. The weir's design was to allow the very high flood tides to reach the pond but to prevent inflow from the average flood tides, with the goal of reducing pond salinity to the optimal level of 2-4 parts per thousand (ppt). Although the weir may have contributed to reducing salt water inflow into the pond from storm tides, the controlling element since 1998 was the silt build-up in Trunk River, which prevented high tides from entering the lagoon, and hence, the pond. In the summer and fall of 2000, pond salinity dropped below the management goal of 2-4 ppt.

- In the winter of 2001, the Town of Falmouth dredged the bottom of Trunk River, lined the bottom, and rebuilt the jetties. From then on, the weir has become the element that controls salt water inflow into Oyster Pond, and the high tides have regularly sent saltwater into the pond, raising salinity to the bottom end of the target level.

Subwatershed facts: (For data sources see Appendix)

- 21 E sites: none
- Solid waste sites: none
- No Interim Wellhead Protection Areas (IWPAs) or Zone IIs.
- Percent of the undeveloped land that is protected (according to 1985/1990 data): 22.9%
- Acres of existing wetlands: 12
- Certified vernal pools: 3
- Named freshwater ponds: none
- Named rivers or creeks: Trunk River
- Beach closures: Surf Beach was closed to swimming for at least one day during the 2001 season due to high enterococcus bacteria counts.
- Shellfish growing areas: Oyster Pond is prohibited to shellfish harvesting.

Priorities:

- Develop critical nutrient loading thresholds for Oyster Pond to aid in water resources planning and the development of TMDLs.
- Manage the recently installed weir-fishway at the outlet of Oyster Pond to find the optimum level for fish migration and salinity control.
- Install a flow-meter at the weir to measure pond level and tidal saltwater inflow-water outflow volumes.
- Measure the productivity of alewife in Oyster Pond. Study the number of fish that come in to spawn and how many survive to the age for their seaward journey.
- Monitor Trunk River for sand buildup and, if necessary, dredge.
- Investigate BMP to control stormwater runoff into the pond.
- Monitor and potentially control invasive species, particularly *Phragmites*.
- Control nutrient loading.
- Shift entire subwatershed to central sewage system (OPET).
- Support OPET's efforts to protect identified parcels from development.
- Acquire open space. Parcels considered a priority for acquisition for water supply protection and development: Falmouth Tracts 4, 6, 11, 12, 19, 26, 33, and 35 were ranked as having medium or high water supply development potential in the Cape Cod Commission's *Priority Land Acquisition Assessment Project* (April 1999). These tracts are located throughout the Town of Falmouth.

Recreation:

Golf courses: none

Pathways and trails:

- Zinn Park and Spohr Gardens
- www.capecodcommission.org/pathways/trailguide.htm

Public access:

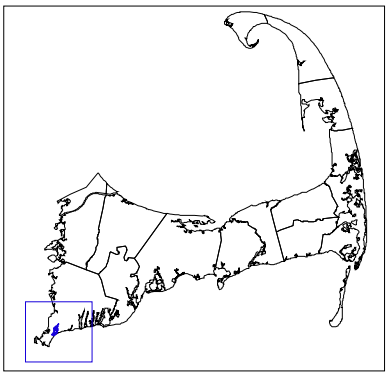
www.state.ma.us/dfwele/pab/pabSEmap.htm

Public beaches and landings:

- Beach on Oyster Pond, Falmouth Beach
- Ransom Road dock, Spohr Gardens dock

Oyster Pond

Falmouth, MA



Watershed Resources

N

0 0.2 0.4 0.6 Miles

Natural Heritage and Endangered Species Program Data
- Certified Vernal Pool
- Priority Habitats of Rare Species
- Estimated Habitats of Rare Species

Groundwater Protection Areas
- Interim Wellhead Protection Area
- Zone II
- Solid Waste Facility

Watershed Boundary

Anadromous Fish Run

Shellfish Growing Areas
- APPROVED
- CONDITIONALLY APPROVED
- MANAGEMENT CLOSURE
- PROHIBITED
- RESTRICTED

Open Space

Streams

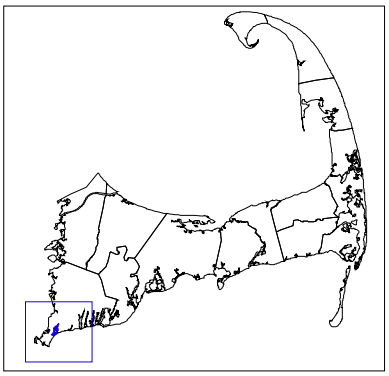
Ponds

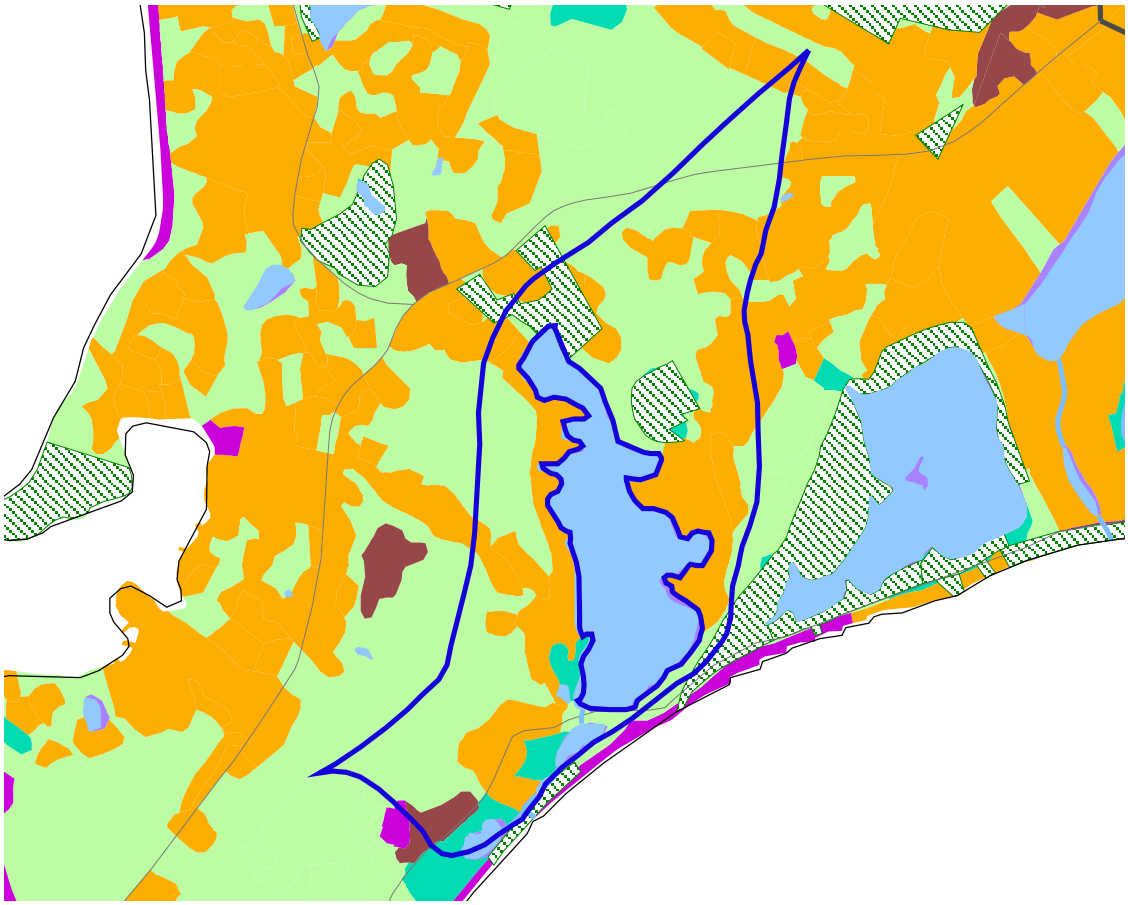
Roads

Prepared by: Courtney Armentrout, EOEA Cape Cod Watershed Team
Winter 2003

Oyster Pond

Falmouth, MA





Land Use

N

0 0.2 0.4 0.6 Miles

Land Use

- non-residential developed
- open land
- recreation
- residential
- water
- wetland
- Streams
- Ponds
- Watershed Boundary
- Protected Open Space

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